

METHODS AND COMPOSITIONS FOR CULTURING A BIOLOGICAL TOOTH

ABSTRACT OF THE DISCLOSURE

5 Tooth tissues include the pulp mesenchyme that forms the dentin and an epithelium
that is responsible for enamel formation. Cells from these tissues were obtained from
porcine third molars and were seeded onto a biodegradable scaffold composed of a
polyglycolic acid - polylactic acid copolymer. Cell polymer constructs were then surgically
implanted into the omentum of athymic nude rats so that the constructs would have a blood
supply and these tissues were allowed to develop inside the rats. Histological analysis of 7.5
10 week-old implants revealed a dentin-like collagenous matrix containing hydroxyapatite
mineral surrounding a core of mesenchymal cells that appeared analogous to pulp tissue.
Infrequently, columnar epithelial cells were observed as a single layer on the outside of the
dentin-like matrix similar to the actual arrangement of ameloblasts over dentin during early
tooth development. Developing tooth tissues derived from such cell polymer constructs
15 could eventually be surgically implanted into the gum of an edentulous recipient where the
construct would receive a blood supply and develop to maturity, providing the recipient with
a biological tooth replacement.

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